ATTACHMENT J32

U.S. Army Fort Knox Wastewater System

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J32.1 U.S. Army Fort Knox Overview

Located in north central Kentucky, Fort Knox is the home of the U.S. Army Armor Center, the U.S. Army Armor School, and the U.S. Bullion Depository. The 170 square mile post is currently under the command of the U.S. Army Training and Doctrine Command (TRADOC).

American soldiers occupied Fort Knox as early as the Civil War. In 1862 the 6th Michigan Infantry constructed the first fortifications in the area. In January 1918, Congress established a field artillery training center that they named Camp Knox after Major General Henry Knox, chief of Artillery for the Continental Army during the American Revolution and later the nation's first Secretary of War. The post was closed as a permanent installation in 1922, but continued to serve until 1932 as a training center for the V Corps, for reserve officer training, Citizens Military Training Camps, and for the National Guard. In 1936 the U.S. Treasury Department began construction of the U.S. Bullion Depository. The Gold Vault was opened in 1937.

On January 1, 1932, Congress designated Camp Knox as a permanent garrison and changed the name to Fort Knox. The Armored Force School and the Armored Force Replacement Center were officially established at Fort Knox October 1, 1940. Today, Fort Knox has an on-post population of nearly 27,000 people and the post serves a total of 163,000 people including over 10,000 soldiers.

J32.2 Wastewater System Description

J32.2.1 Wastewater System Fixed Equipment Inventory

The U.S. Army Fort Knox wastewater system consists of all appurtenances physically connected to the system from the point of demarcation. Generally, the point of demarcation will be the termination of a building's service line at the collection system including the collection joint. The system may include, but is not limited to, pipelines, lift stations, manholes, (~~septic tanks~~ (delete) and a wastewater treatment plant. The following description and inventory is included to provide the Offeror with a general understanding of the size and configuration of the system. The Offeror shall base the proposal on site inspections, information in the offeror's library, other pertinent information and the following description. Under no circumstances shall the successful Contractor be entitled to any rate adjustment based on the accuracy of the following description and inventory.

J32.2.1.1 Description

Wastewater Collection System

The U.S. Army Fort Knox wastewater collection system consists of sewer mains and service connections for disposal. The sewer mains direct sewage from both the base and the City of Muldraugh, Kentucky to a wastewater treatment plant located on the base. The collection system on the base consists of

approximately 922,870 feet of sewer mains ranging in size from 2" to 36", with 8" being the most common size. There are approximately 1,745 manholes within the base collection system.

The collection system is broken up into four individual classifications that are identified with the letters C, H, M and W followed by two numbers (e.g. C10). Letter C is an abbreviation for Capart Housing, letter H is an abbreviation for other housing, M is an abbreviation for Military and W is an abbreviation for Wherry Housing. The two numbers followed by two zeros represent block numbers (e.g. 1000 Block).

The age of the wastewater collection system ranges from 70 years old to 1-year-old and can be divided into three major age groups with the majority of the collection system being constructed prior to 1940. **Table 1** presents a summary of the age distribution.

TABLE 1
Wastewater Collection System Age Distribution
Wastewater Collection System U.S. Army Fort Knox

Year	Sewer Main Length in ft	Number of Manholes
< 1950	516,807	1,205
1950 - 1989	304,547	486
1990 - 2000	101,515	54

Lift Stations

The U.S. Army Fort Knox collection system includes a total of twenty (20) lift stations with sixteen (16) containing submersible pumps, three (3) containing dry pit pumps, four (4) containing grinder pumps and one (1) containing a sewage ejector.

The lift stations containing submersible pumps include pumps ranging in size from 2 to 40 hp. Fourteen (~~Eleven~~ delete) (14) are identified as the following building numbers: 2389A, 2389B, 4015, 6151, 4767, 4990, 6035, 7233, 7238, 7241, 9384, 9101A, 9387 and 5543. The remaining two (2) lift stations are located at the following locations: Brave Rifles, (~~Ammo Storage~~ delete) and Camp Carlson 9101B.

The lift stations containing dry pit pumps include pumps ranging in size from 10 to 60 hp and are identified as the following building numbers: 4208, 5540 and 7873.

The sewage ejector has a capacity of 50 gpm and is identified as Bldg. 4002. (~~The lift station containing two (2) grinder pumps, with 2 hp motors each, is identified as Bldg. 4760~~. DELETE)

Seven (7) lift stations have emergency generators as part of their system. These lift stations are identified as the following building numbers with the size of the generator in parentheses: 4002 (10 KW), 4015 (188 KW), 4208 (256 KW), 5540 (169 KW), 6151 (33 KW), 7873 (100KW), 4767 (33 KW).

The age of the lift stations ranges from 58 years old to 1-year-old and can be divided into three major age groups. **Table 2** presents a summary of the age distribution of the lift station structure. The equipment in the lift station has typically been replaced and is significantly newer than the date listed.

TABLE 2
Lift Station Age Distribution
Wastewater Collection System U.S. Army Fort Knox

Year	Number of Lift Stations
< 1950	2
1950 - 1989	10
1990 - 2000	8

Wastewater Treatment System

The U.S. Army Fort Knox wastewater treatment system consists of one 6 million-gallons-per-day (MGD) wastewater treatment plant. (~~and two septic tanks~~.DELETE) The wastewater treatment plant is designed for an average wastewater flow of 6 MGD, a maximum daily flow of 14 MGD and a peak (~~hourly~~ DELETE) wastewater flow of 18 MGD.

The wastewater treatment plant consists of the following components:

- Preliminary Treatment
  - Two Mechanical Bar Screens
  - Two Vortex Grit Removal System
  - Influent Lift Station
- Septage Receiving Station – 10,000 gal capacity
- Two Extended Aeration Oxidation Ditches at 2.55 MGD capacity each with four 75 hp brush surface rotors each
- Four Secondary Clarifiers at 75’ diameter and 13’ SWD
- Sludge pumping includes six 15 hp return activated sludge pumps and six 5 hp waste activated sludge pumps
- Two Chlorine Contact Basins at 93,750 gal each, with a total of two chlorine gas feeders with (~~Two~~ delete) Dechlorination Injection System (~~Chambers, one following each chlorination basin, with~~ delete) and a total of two sulfonators
- Two Gravity Sludge Thickeners at 35’ diameter and 13’ SWD
- Two Aerobic Digesters at 65’ by 65’ and 17’ SWD with three 150 hp Blowers and Coarse Bubble Air Diffusion
- Sludge Dewatering Facility with two Belt Press Systems, 2 m width each, polymer feeds, sludge handling pumps, and conveyor systems
- Non-potable water system capable of supplying between 250 gpm and 500 gpm.
- 17 Sludge Dryng Beds, 63280 SF, with filtrate return pumps, 2' + depth

This wastewater treatment plant handles flows from both the Base and the City of Muldraugh. Between April 1999 and March 2000, the wastewater treatment plant received an average influent flow of 3.3 MGD and a maximum daily influent flow of 13.8 MGD. In addition, plant personnel indicated that during wet weather, the influent flow into the treatment plant could be as high as 20 MGD.

(~~Two septic tank systems are used on the Base. One is located north of the City of Muldraugh in the Armor Board Area and the other is located in the Ammo Storage Area~~. Delete)

Emergency Generator will be owned and maintained by Nolin RECC. Generator will be available at all times for emergency backup.

The seventeen (17) sludge drying beds at the WWTP are regulated as Solid Waste Management Units (SWMUs) by the Corrective Action section of our Hazardous Waste Storage Permit (Part B), IAW the Resource Conservation and Recovery Act (RCRA). A RCRA Facility Investigation (RFI) has been accomplished. Based on the results of the RFI, more investigation or remediation/monitoring will need to be performed. This will be the responsibility of the Contractor.

J32.2.1.2 Inventory

Table 3 provides a general listing of the major collection system fixed assets for the U.S. Army Fort Knox wastewater treatment system included in the purchase. The system will be sold in a "as is, where is" condition without any warranty, representation, or obligation on the part of Government to make any alterations, repairs, or improvements. Ancillary equipment attached to, and necessary for, operating the system, though not specifically mentioned herein, is considered part of the purchased utility**.**

TABLE 3
Fixed Inventory
Wastewater System U.S. Army Fort Knox

Item	Size	Quantity	Unit	Approximate Year of Construction
Pipe	2"	3,00	Linear Feet	Various
	4"	16,300	Linear Feet	Various
	6"	263,500	Linear Feet	Various
	8"	414,000	Linear Feet	Various
	10"	52,200	Linear Feet	Various
	12"	54,300	Linear Feet	Various
	15"	43,000	Linear Feet	Various
	18"	28,100	Linear Feet	Various
	20"	4,600	Linear Feet	Various
	21"	3,000	Linear Feet	Various
	24"	17,700	Linear Feet	Various
	30"	15,600	Linear Feet	Various
	36"	7,070	Linear Feet	Various
Manholes		1,745	Each	Various
Lift Stations		20	Each	Various
delete				
~~Wastewater Treatment Plant~~		~~1~~	~~Each~~	~~1995~~

J32.2.2 Wastewater System Non-Fixed Equipment and Specialized Tools Inventory

Table 4 lists other ancillary equipment (spare parts) and **Table 5** lists specialized vehicles and tools included in the purchase. Offerors shall field verify all equipment and tools prior to submitting a offeror

(~~bid~~ delete). Offerors shall make their own determination of the adequacy of all equipment and tools. The successful Contractor shall provide any and all equipment, vehicles, and tools, whether included in the purchase or not, to maintain a fully operating system under the terms of this contract.

TABLE 4
Spare Parts
Wastewater System U.S. Army Fort Knox

Qty	Item	Description	Remarks
		The spare parts inventory varies on a day-to-day basis, but is estimated to be worth $ 64,000.	

TABLE 5
Specialized Equipment and Vehicles
Wastewater System U.S. Army Fort Knox

Qty	Item	Description	Remarks
		Wastewater Treatment Plant Laboratory Equipment	
1	Ea	Incubator – Model #MFU20F3GW	
1	Ea	11.8 Refrigerator – Model #TB12SBB	
1	Ea	Desiccator	
1	Ea	Timer – Model #171	
1	Ea	Steam Sterilizer – Model #800V	
1	Ea	Lab Oven – Model #10201C	
1	Ea	Lab Line – Model #4205	
1	Ea	Still – Wall Mount	
1	Ea	Water Bath – Model #5D	
1	Ea	Colony Counter – Model #3325	
1	Ea	D.O. Meter – Model 54ARC	
1	Ea	VAC Pump – Model #XX6000000	
1	Ea	Balances – Model #AC100	
2	Ea	ISCO Sampler – Model #6700FR	
		Wastewater Treatment Plant Collection System Equipment	
1	Ea	Jet Rodder and Vacuum Truck	
1	Ea	Farm Tractor	
1	Ea	Trash Pump, 3” Discharge, 5 HP Gas Motor	
1	Ea	Electric Eel Sewer Machine and Trailer	
1	Ea	Model 666 Sewer Rodder	
		Wastewater Treatment Plant Equipment	
1	Ea	Forklift	

1	Ea	Truck, Light Cushman
1	Ea	Pump, Fairbanks-Morse, W-3 Water, Vertical Turbine, 3-Stage, Model #7M-7000AW
1	Ea	Pump, Johnston – Series JT, 3-Stage Propeller, Beltwash, Model #6AC-3
1	Ea	Pump, FLYGT, Submersible – 35 HP, 2250 GPM, Raw Wastewater, Model #CP-3201X-MT
1	Ea	Pump, FLYGT, Submersible – 5 HP, Dillution Water, Model #CP-3102
1	Ea	Pump, Chlorine Induction – Model SWC 3F
1	Ea	Pump, Sulfur Dioxide Induction – Model SWC 2F
1	Ea	Pump, Submersible, Sewage, Zoeller – 1 HP, 230V, Model #E-284C
1	Ea	Motor, SEW, Eurodrive, 230/460V, 3 HP, Belt Press Drive, Type DF26BHSDT100L24-KS
1	Ea	Motor, GE, 184T-FR, 5 HP, 230/460V, Sludge Conveyor, Model #5KS184BC205
1	Ea	Motor, Baldor, 215T-FR, 10 HP, 230/460V, PTB Air Handler Drive, Model #37F380X954

J32.2.3 Wastewater System Manuals, Drawings, and Records Inventory

Table 6 lists the manuals, drawings, and records that will be transferred with the system.

TABLE 6
Manuals, Drawings, and Records
Wastewater System U. S. Army Fort Knox

Qty	Item	Description	Remarks
3	12 Volumes	Wastewater Treatment Plant O&M Manuals	None N/A
1	Set	Wastewater Treatment Plant Construction Drawings	None N/A
1	Set	Wastewater Treatment Plant As-Built Drawings	Reviewing

J32.3 Specific Service Requirements

Excess Capacity

The wastewater treatment plant currently has excess capacity except during some storm water events. The Contractor may use the excess capacity per paragraph C.4.2. However this excess capacity is reserved for mobilization and must be available to Fort Knox at any time. Full capacity of treatment plant must be maintained in order to meet mobilization requirements**.**

Pretreatment Program

Successful offeror shall implement and maintain a Pretreatment Plan in accordance with KPDES permit. The U.S. Army Fort Knox currently has a pretreatment program for their wastewater treatment

plant and a copy of the program is available for viewing. The objective of the pretreatment program is to prevent violation of the Clean Water Act by preventing the introduction of pollutants into the Wastewater Treatment Plant that could interfere with its operation; and/or prevent the pass-through of pollutants that could cause a violation of the operating permit limitations and/or applicable water quality standards. The Pretreatment Program document, dated 26 November 1996, presents a description of the pretreatment program including discharge limits for pollutants, typical sampling locations and a monitoring plan. Activities associated with the pretreatment program include, but are not limited to, facility monitoring and source identification of prohibited pollutants. Facility monitoring includes facility inspections, wastewater sampling/analysis and wastewater flow measurement. Facility inspections include semi-annual formal inspections and informal inspections as required. Sampling/analysis includes quarterly scheduled sampling/analysis events for each facility and unscheduled random sampling/analysis events as required. Flow from each facility is measured as required to quantify waste streams. Currently, a total of 25 on-base facilities and the City of Muldraugh are being monitored as part of the pretreatment program.

Geographical Information System

The Government shall furnish available drawings and related engineering and property information to the Contractor within sixty (60) days of contract award. Such available drawings of the wastewater system may not be comprehensive. Drawings and related property information shall include, but not be limited to, wastewater system facilities and distribution lines and related system components. The Contractor shall thereafter incorporate the entire privatized wastewater system into an automated Geographical Information System (GIS) compatible with the Government system within six (6) months of receipt of the Government furnished information. GIS system being utilized by Government is GEOSYNC and drawings are in AUTOCAD format. Information on manholes, sewer lines, lift stations and treatment facilities shall be included in the GIS system. Information shall include, but not be limited to, sewer line pipe sizes, materials, and age, manhole type, materials, age, and invert elevations, lift station pipe sizes, materials, age and invert elevations, valve sizes, materials and age, lift station pump sizes, materials and age, emergency generators information, and treatment plant information. The Contractor shall maintain "as-built" drawings for all facilities and related system components installed and/or modified and update the Government GIS system within ninety (90) days after installation/modification. Upon reasonable request and with reasonable notice, the Government may inspect and copy such drawings and the Contractor shall provide available to the Government.

J32.4 Current Service Arrangement

The U.S. Army currently provides wastewater collection and treatment service for Fort Knox and the City of Muldraugh. Current service agreement with City of Muldraugh shall remain in affect for a period of one year after award. At that time a new agreement may be negotiated. Other treatment services to be provided include treatment of waste from Field Latrines and grey water placed in system at Septic Receiving Station by contractors and units, treatment of Landfill Leachate placed by contractor in Burke Motor Park Manhole, and treatment of cooked grease from dining facilities and soil from car wash placed on drying beds by contractors. The treated wastewater is discharged into Mill Creek under a Kentucky Pollutant Discharge Elimination Permit # KY 0002917.

J32.5 Secondary Metering

There are currently no requirements for secondary metering of wastewater included in this contract. Any future wastewater secondary metering requested by the Government will be IAW C.3, Future Secondary Meters.

J32.6 Monthly Submittals

In addition to the submittal requirements from Clause H.5, the Contractor shall provide the Government monthly submittals for:

1. Invoicing (IAW G.2) for the previous months services. The Contractor's invoice shall be prepared in a format proposed by the Contractor and accepted by the Contracting Officer. Monthly invoices shall be submitted to Directorate of Base Operation Support, Engineer and Services Division, Building 1110, Fort Knox, KY 40121.

2. Monthly interruption report for the previous month. The Contractor's monthly interruption report shall be prepared in the format presented in Attachment 1.

3. System Efficiency Report. If required by Clause C.3 the Contractor shall submit a system efficiency report in a format proposed by the Contractor and accepted by the Contracting Officer.

J32.7 Infiltration and Inflow (I&I) Projects

IAW C.3, Utility Service Requirement, only an Infiltration and Inflow Study has been implemented by the Government for managing and monitoring I&I.

Roy F. Weston, Inc. conducted an Infiltration and Inflow Study for the U.S. Army Fort Knox Base in November 1998. The study's scope was to identify sources of infiltration and inflow in the Base's wastewater collection system. Infiltration is defined as water originating from rainfall or groundwater seepage flowing into the wastewater collection system through cracks in pipes and separated pipe joints. Inflow is defined as water being contributed to the wastewater collection system from connected housing sump pumps, storm sewers and roof drains.

For the purpose of the study, the entire base wastewater collection system was divided into ten distinct drainage basins. The study included the inspection of 50 manholes and dry and wet weather flow monitoring throughout the entire wastewater collection system. During the flow monitoring, the flow meters were checked for accuracy and reliability once per day.

Manhole inspection indicated that most manholes had cracked offset rings and some pipe to manhole connections were also cracked. Both of these conditions can result in significant infiltration. The flow monitoring indicated, that all basins except one had no significant I&I sources. One drainage basin exhibited I&I of between 1,500 to 2,000 gpd/idm.

Weston, Inc.'s major recommendations were to repair cracked offset rings and pipe to manhole connections and to investigate the one drainage basin with the highest I&I for the location of pipe cracks and non-wastewater connections. A copy of I & I report will be available for viewing during solicitation process and will be provided to sucessful offeror.

J32.8 Service Area

IAW Clause C.4, Service Area, the service area is defined as all areas within the installation boundaries. Fort Knox has a total area of approximately (~~about~~ delete) 170 square miles. The northern boundary of the installation is the Ohio River and the town of Cupio. On the east (~~west~~ delete), the installation extends to Beech Grove and Lebanon Junction. The south is bounded by highway 313 and Radcliff, while the western (~~eastern~~ delete) boundary is Rock Haven and Red Hill.

J32.9 Off-Installation Sites

There is only one off-installation site, which is the City of Muldraugh. The City is located approximately one (1) mile north of the U.S. Army base and has an approximate (~~total~~ delete) population of 1,376. The requirement for sewage services is part of and associated with this scope. The City of Muldraugh maintains the sewer system to the end of the force main.

J32.10 Specific Transition Requirements

IAW Clause C.17, Transition Plan, **Table 7** lists service connections and disconnections required upon transfer, and **Table 8** lists the improvement projects required upon transfer of the Fort Knox wastewater collection and treatment system. Other transition requirements include development of a modified pretreatment program including reassigning of specific duties and reporting requirements.

TABLE 7
Service Connections and Disconnections
Wastewater System U.S. Army Fort Knox

Location	Description
None Identified	

TABLE 8
System Improvement Projects
Wastewater System U.S. Army Fort Knox

Project Location	Project Description
None Identified	